

Application No. 10/711,403
Technology Center 1775
Amendment dated May 21, 2007
Reply to Office Action dated February 20, 2007

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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (Currently amended): A hydrocarbon fluid containment article through which a hydrocarbon fluid flows, the hydrocarbon fluid containment article comprising:

a wall having a first surface and an oppositely-disposed second surface, each of the first and second surfaces having a surface finish;

a first coating system on the first surface of the wall and wetted by the hydrocarbon fluid, the first coating system comprising an outermost layer consisting ~~essentially~~ of platinum and a ceramic barrier layer between the outermost layer and the wall, the hydrocarbon fluid contacting and flowing across the outermost layer, the platinum of the outermost layer catalyzing the hydrocarbon fluid to form particulates of carbonaceous gum substances suspended within the hydrocarbon fluid, the ceramic barrier layer being sufficiently thick to inhibit interdiffusion between the outermost layer and the wall; and

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a second coating system on the second surface of the wall and exposed to an environment at a temperature higher than the hydrocarbon fluid, the second coating system comprising an outermost layer of platinum and a ceramic barrier layer between the outermost layer and the wall, the outermost layer being exposed to the environment so as to reflect radiant energy into the environment;

wherein each of the outermost layers and each of the ceramic barrier layers is deposited by chemical vapor deposition so that the first coating system has a surface finish that replicates the surface finish of the first surface of the wall and the second coating system has a surface finish that replicates the surface finish of the second surface of the wall.

Claim 2 (Previously presented): The hydrocarbon fluid containment article according to claim 1, wherein the outermost layer of the second coating system has a thickness of about 150 to about 200 nm.

Claim 3 (Previously presented): The hydrocarbon fluid containment article according to claim 1, wherein the barrier layer of the second coating system has a thickness of about 500 to about 1500 nm.

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Claim 4 (Previously presented): The hydrocarbon fluid containment article according to claim 1, wherein the barrier layer of the second coating system is formed of at least one ceramic material chosen from the group consisting of silica, alumina, tantala, hafnia, yttria, and chemical combinations of silica with boron and/or phosphorous and/or alumina.

Claim 5 (Original): The hydrocarbon fluid containment article according to claim 1, wherein the hydrocarbon fluid is at a temperature of about 105°C to about 345°C.

Claim 6 (Currently amended): The hydrocarbon fluid containment article according to claim 1, wherein the outermost layer of the second coating system consists ~~essentially~~ of platinum.

Claim 7 (Original): The hydrocarbon fluid containment article according to claim 1, wherein the article is a gas turbine engine component.

Claim 8 (Original): The hydrocarbon fluid containment article according to claim 1, wherein the article is a gas turbine engine component

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chosen from the group consisting of fuel/air heat exchangers, pipes, fuel nozzles and oil sumps.

Claim 9 (Currently amended): A gas turbine engine component comprising:

a wall having a first surface and an oppositely-disposed second surface, each of the first and second surfaces having a surface finish;

a first coating system on the first surface of the wall and wetted by the hydrocarbon fluid at a temperature of about 105°C to about 345°C, the first coating system comprising an outermost layer consisting ~~essentially~~ of platinum and a ceramic barrier layer between the outermost layer and the wall, the outermost layer being wetted by the hydrocarbon fluid and inhibiting the formation and adhesion of carbonaceous deposits on the wall by catalyzing the hydrocarbon fluid to form particulates of carbonaceous gum substances suspended within the hydrocarbon fluid, the ceramic barrier layer being sufficiently thick to inhibit interdiffusion between the outermost layer and the wall; and

a second coating system on the second surface of the wall and exposed to an environment at a temperature higher than the hydrocarbon

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fluid, the second coating system comprising an outermost layer consisting ~~essentially~~ of platinum and a ceramic barrier layer between the outermost layer and the wall, the outermost layer of the second coating system being exposed to the environment so as to reflect radiant energy into the environment;

wherein each of the outermost layers and each of the ceramic barrier layers is deposited by chemical vapor deposition so that the first coating system has a surface finish that replicates the surface finish of the first surface of the wall and the second coating system has a surface finish that replicates the surface finish of the second surface of the wall.

Claim 10 (Original): The gas turbine engine component according to claim 9, wherein the outermost layer of each of the first and second coating systems has a thickness of about 150 to about 500 nm.

Claim 11 (Original): The gas turbine engine component according to claim 9, wherein the outermost layer of each of the first and second coating systems has a thickness of about 150 to about 200 nm.

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Claim 12 (Original): The gas turbine engine component according to claim 9, wherein the barrier layer of each of the first and second coating systems has a thickness of about 500 to about 1500 nm.

Claim 13 (Original): The gas turbine engine component according to claim 9, wherein the barrier layer of each of the first and second coating systems has a thickness of about 700 to about 1300 nm.

Claim 14 (Original): The gas turbine engine component according to claim 9, wherein the barrier layer of each of the first and second coating systems is formed of at least one ceramic material chosen from the group consisting of silica and alumina.

Claim 15 (Original): The gas turbine engine component according to claim 9, wherein the component is chosen from the group consisting of fuel/air heat exchangers, pipes, fuel nozzles and oil sumps.

Claim 16 (Original): The gas turbine engine component according to claim 9, wherein the outermost layers of each of the first and second

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coating systems are simultaneously deposited by chemical vapor deposition to have substantially identical thicknesses, and the barrier layer of each of the first and second coating systems are simultaneously deposited by chemical vapor deposition to have substantially identical thicknesses.

Claim 17 (Original): The gas turbine engine component according to claim 9, wherein the outermost layers have surface roughnesses of not greater than about one micrometer R_a .

Claim 18 (Canceled)

Claim 19 (Previously presented): The hydrocarbon fluid containment article according to claim 1, wherein the hydrocarbon fluid is a liquid.

Claim 20 (Canceled)